

National Aeronautics and
Space Administration
Office of the Administrator
Washington, DC 20546-0001



April 8, 2009

Dr. Kenneth M. Ford
Chairman
NASA Advisory Council
Washington, DC 20546

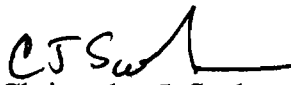
Dear Dr. Ford:

Enclosed are NASA's responses to the recommendations resulting from the NASA Advisory Council's meeting on February 5, 2009. As you will see, Aeronautics Research and Science Mission Directorates are actively engaged in addressing the points that the Council has raised.

Please do not hesitate to contact me if the Council would like further background on the information provided in the enclosures.

I look forward to receiving continued advice from the Council.

Sincerely,


Christopher J. Scolese
Acting Administrator

Enclosures

1. A-09-01
2. S-09-01
3. S-09-02

NASA Advisory Council
Committee Recommendations
Tracking Number: A-09-01

**Community input to NASA's formulation of the system-level program on
Environmentally-Responsible Aviation (ERA)**

NASA Response Authors

Primary: Jaiwon Shin

Support: Jean Wolfe

Recommendation

Convene a small, two-step workshop under the NASA Advisory Council (NAC) Aeronautics Committee to provide external community input to NASA's formulation of the system-level program on Environmentally-Responsible Aviation (ERA).

Major reasons for proposing the Recommendation

With the expected three-fold increase in global air travel over the next 30 years, the reliability and environmental impact of aviation are becoming critical issues for the future of flight, including safety, efficiency, noise, emissions, and fuel consumption (NO_x, CO₂, and H₂O). NASA is currently in the preliminary planning stage of an activity to develop tools and technologies that will address these major issues. It is therefore critical to get independent feedback from the broader aeronautics community before NASA embarks on such a large effort.

NASA Response

In response to the NAC recommendation, the NASA Aeronautics Research Mission Directorate (ARMD) has contracted with the National Research Council (NRC) of the National Academies to convene a meeting of experts on May 14-15, 2009 on NASA's plans for system-level research in ERA. The meeting will be open to the general public and will be held in the Washington, D.C. area. Participants will include 20-25 subject matter experts (to be selected by the NRC), 5 NRC staff, 20-25 NASA ARMD senior management, and will allow space for 20-25 individuals from the general public. At the meeting, NASA will discuss its current plans for ERA and will hear comments and observations from the subject matter experts, as well as the general public. After the meeting, NASA will consider those comments and observations in the refinement of its ERA plans. At the July 2009 NAC meeting, NASA will present its updated plans to the Aeronautics Committee and will discuss with them how the comments and observations were dispositioned.

Enclosure 1

Response to NASA Advisory Council Recommendation
Tracking Number S-09-01

Communicate lessons learned on large mission cost drivers to the Science Committee and to decadal survey committees.

NASA Response Authors

Primary: SMD/G. Williams

Support: SMD/M. Allen

Recommendation

Compile lessons learned on pre-phase B cost estimation for large missions, including influence of interactions among the science community, the National Research Council (NRC), NASA Headquarters, and Centers. Provide initial product to the Science Committee in its July meeting prior to provision to the NRC committees undertaking the new round of decadal surveys in the space sciences. Provide a progress report on this task to the Science Committee in April.

Major Reasons for Proposing the Recommendation

NRC decadal surveys establish community and stakeholder expectations for missions to be developed and launched in the coming decade or beyond. Mission concepts are generally ranked in priority order by cost class. In the last round of NRC decadal surveys, some high priority mission(s) ranked on the basis of an initial cost estimate turned out to be two to four times as expensive to develop. This leads to questions of whether those same rankings would have been assigned had more realistic cost estimates been available and whether some different mix of missions might have been recommended to achieve the optimal science return within available funding constraints. NRC decadal survey committees need to understand how early choices in mission concept design lead to cost growth so they can structure their recommendations to be more robust over time.

NASA Response

NASA concurs with the recommendation. The NASA Authorization Act of 2008 requires NASA to submit a report to Congress on this subject; in their words, to arrange for “an independent external assessment to identify the primary causes of cost growth” in space and Earth science missions. NASA is responding to the Congressional requirement via a NRC study that will:

- Review the body of existing studies related to NASA space and Earth science missions and identify their key causes of cost growth and strategies for mitigating cost growth;
- Assess whether those key causes remain applicable in the current environment and identify any new major causes; and
- Evaluate effectiveness of current and planned NASA cost growth mitigation strategies and, as appropriate, recommend new strategies to ensure frequent mission opportunities.

NASA made a formal request to the NRC on February 19, 2009, to undertake this study, and we expect to receive the NRC's study proposal shortly. In NASA's exchange of information with the NRC study committee, we will provide them with up-to-date information on the history and status of the Mars Science Laboratory and any other current projects they identify as important to their work.

NASA intends that this study should also be our implementation of the NAC's recommendation. While the NRC study is envisioned to require six months more time than recommended by the NAC, we feel this will be a timely and effective way to influence the decadal surveys because NASA is funding the Astro2010 committee to secure independent cost analysis of candidate mission concepts and these Astro2010 findings can flow into the NRC study on decadal survey cost estimates.

NASA will update the Science Committee in April on the progress of the study initiation.

Response to NASA Advisory Council Recommendation
Tracking Number S-09-02

International collaboration in space and Earth science.

NASA Response Authors

Primary: SMD/M. Allen, D. Halpern

Support: SMD/G. Williams

Recommendation

NASA should continue planning the implementation of decadal survey recommendations by considering the plans of other nation's space agencies. Where strategic interests align, NASA should work with foreign partners to collaborate in program architecture development, including coordinated mission commitments with shared data as well as joint missions.

Major Reasons for Proposing the Recommendation

Science objectives are often shared among nations. International science and space agencies often have similar objectives to the U.S., as evidenced by comparing the National Research Council (NRC) decadal surveys with the science plans of Europe or Japan. NASA and its partner space agencies in other nations often collaborate on specific missions through provision of science instruments, spacecraft, or launch services. Collaboration in future mission planning could result in coordinated decisions to pursue complementary mission objectives and shared resultant science data.

NASA Response

NASA concurs with the recommendation. NASA's Earth Science Division (ESD) conducts a program of breakthrough research to advance fundamental knowledge on the most important scientific questions on the global and regional integrated Earth system. ESD has long recognized the importance of acquiring international expertise and leveraging U.S. resources to achieve its vision. In FY 2009, NASA is operating 15 on-orbit satellites, of which 9 have instruments from other countries: Aqua (Brazil, Japan), Aura (Finland, Netherlands, United Kingdom), CloudSat (Canada), CALIPSO (France), GRACE (Germany), Jason (France), OSTM (France), Terra (Canada, Japan), and TRMM (Japan). ESD has five missions in formulation and development, of which two have foreign instruments: Aquarius (Argentina) and GPM (Japan). For missions beyond those currently in development, the principal determinant of NASA's priority is described in the NRC Decadal Survey. Preliminary discussions have occurred with Canada for SMAP, with Germany and Japan for DESDynI, with United Kingdom for CLARREO, and with France for SWOT.

NASA ESD aircraft- and surface-based instruments are used to calibrate and enhance interpretation of high accuracy, well-calibrated Earth satellite observations. Global ground-based networks involve cooperation and collaboration with 20 or more countries. Each year,

airborne campaigns involve cooperation and collaboration with about six countries. NASA satellite communications capabilities provide NASA investigators access to foreign satellite measurements, e.g., Canada's RADARSAT data. In addition, NASA strongly supports the Committee on Earth Observing Satellites (CEOS) through extensive support of the CEOS Systems Engineering Office and co-leadership of the CEOS Atmospheric Composition and Precipitation Constellations.

In the space sciences, NASA is dramatically deepening its engagement with key foreign partners in strategic planning, especially with the European Space Agency (ESA), NASA's principal partner in space science missions. Our overall approach is to synchronize our future mission planning with ESA's Cosmic Vision process for defining their mission portfolio for the later part of the next decade.

- In planetary science, NASA has conducted joint studies of Europa-Jupiter System and Titan-Saturn System missions with ESA, and the two agencies have recently jointly announced the intention to collaborate closely to pursue the former mission concept. Intensive discussions are currently under way with ESA to integrate NASA and ESA planning for the Mars launch opportunities in 2016, 2018, and 2020. Also, NASA has directed that in conducting the new planetary science decadal survey, the NRC "should ensure that the study and report reflect an awareness of the science and space mission plans and priorities of potential foreign and U.S. agency partners and should identify opportunities for cooperation, as appropriate."
- In Astrophysics, NASA and ESA are working toward coordinated solicitations for development of a joint dark energy mission to fly in mid-next decade. This would combine preliminary U.S. planning with two concepts evolving from the ESA Cosmic Vision process.
- In Heliophysics, NASA has announced a selection of an instrument to fly on the next major ESA effort in this area, Solar Orbiter, intended for launch soon after mid-decade.

Mission Abbreviations:

CALIPSO	Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations
CLARREO	Climate Absolute Radiance and Refractivity Observatory
DESDynI	Deformation, Ecosystem Structure, and Dynamics of Ice
GPM	Global Precipitation Measurement
GRACE	Gravity Recovery And Climate Experiment
OSTM	Ocean Surface Topography Mission
SMAP	Soil Moisture Active-Passive
SWOT	Surface Water and Ocean Topography